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ABSTRACT

Few manpower projects in Southern states have focused on the demand for the output of four-year colleges and universities. Even fewer have attempted to link projections of demand for degree programs to the supply of graduates generated by those programs. Moreover, none have set the state outlook for a particular college-trained skill within a context of the supply-demand balance picture for neighboring states and the South in the aggregate. From a career guidance perspective, if not in an educational planning context, such a comprehensive evaluation is required. It is the intent of this document to present preliminary state-by-state projections of supply-demand balances for a limited selection of degree specialties in the context of similar projections for the Southern region as a whole developed under the same general methods. The projections of degrees by level, by state, and by field of study are based on the region's share of U.S. degrees according to projections by the U.S. Office of Education (USOE), and the historical distribution of degrees in the region by degree levels relative to the U.S. historical distribution. All graduates at all degree levels have been classified into 20 major fields of study. Generally the data reflected limited opportunities for Southern college graduates in the traditional field of work (conventional projection) but show openings in the extended list of occupations (comprehensive projection) to be more likely during the 1970's. (Author/KE)

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Supply and Demand Balances of Selected College-Level Fields Projected for the SREB States

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Foreword

The Manpower and Education project of the Southern Regional Education Board, with partial funding from the Exxon Education Foundation, has issued a variety of general and specific reports focusing on the use of manpower information for higher educational program design and career guidance. The present publication highlights regional maps dealing with 19 fields of study for which the authors consider it possible to quantify conditions of relative imbalance of supply and demand in the near future.

In a world of mounting educational costs, the existence of manpower deficits and surpluses must be considered less a matter for widespread "correction" of program allocation than the occasion for wise use of existing educational resources and the encouragement of free response to job opportunities throughout the region. For example, the map for optometry (Figure 18) depicts surpluses and deficits in the context of degree outputs by the three optometry schools now serving the entire region. Planning of additional training capacity deserves serious consideration, but even so, in the foreseeable future most states will continue to look elsewhere in the region for training in that field.

The SREB manpower and education staff solicits suggestions and reactions regarding usefulness of the material as presented, both in educational planning and in career guidance.

Winfred L. Godwin
President

Introduction

Few manpower projects in Southern states have focused upon the demand for the output of four-year colleges and universities. Even fewer have attempted to link projections of demand for degree programs to the supply of graduates generated by those programs.[1] Moreover, none have set the state outlook for a particular college-trained skill within a context of the supply-demand balance picture for neighboring states and the South in the aggregate. From a career guidance perspective, if not in an educational planning context, such a comprehensive evaluation is required. As an illustration, a potential nursing graduate must receive more than the news that the supply of nurses will exceed the demand in her state and the region as a whole. She would benefit from an indication that specific neighboring states are expected to produce substantially fewer nursing graduates than will be hired in the coming years.

It is the intent of this report to present preliminary state by state projections of supply-demand balances for a limited selection of degree specialties in the context of similar projections for the Southern region as a whole, developed under the same general methods.[2]

Methods and Terminology

Several terms need defining to orient the reader and facilitate communication of the findings. The explanations given below, in effect, summarize many details in methodology.

Projection of Supply

The projections of degrees by level, by state, and by field of study are based on the region's share of U.S. degrees, according to projections by the U.S. Office of Education (USOE), and the historical distribution of degrees in the region by degree levels relative to the U.S. historical distribution.[3] The distribution of degrees by field of study is based on changes in the distribution in the Southern region from 1964 to 1972, with adjustments to reflect a gradual convergence of the regional SREB distribution toward that projected by USOE for the nation in 1980.

The total number of degrees at all levels projected for the region for 1980 exceeds the 1972 total by 18 percent, thus allowing for moderate growth during the rest of the decade.

Degree Programs

All graduates at all degree levels, have been classified into 20 major fields of study. A number of subfields, well recognized as leading to specific occupations, were chosen for separate projections. For example, nursing and dental hygiene (sub-fields of the major field, "health professions") definitely lead to the occupations of registered nurse and dental hygienist, respectively. However, other subfields which may or may not lead to a specific occupation have not been projected as subfields separate from their major fields of study.

Market-Ready Supply of College Graduates

This differentiates the supply of total degrees in any one year, at all levels, from the supply of graduates in that year who potentially are new entrants into the labor market. It adjusts for a small proportion of female bachelor's level graduates who do not enter the labor market, for bachelor's degree recipients who continue as full-time graduate students and thus are not available to work, and for graduate students who were already employed full-time in their own fields while earning advanced degrees and do not constitute *new* entrants into the college level job market.

Education Graduates

The education field of study classification in this report has been adjusted to include the number of graduates estimated to have earned

teaching certificates in conjunction with other academic fields of study. Each academic field of study that contributes graduates with teaching certificates has been adjusted downward by the corresponding estimated percentage of teaching certificates.

Comprehensive Demand Projection

This report presents two projections of average annual 1970-1980 occupational openings in the region. The comprehensive projection covers openings across the entire range of the 421 occupations in the U.S. Bureau of Census classification system — from teacher to truck driver, physician to postman.

Conventional Demand Projection

This projection covers only the 136 occupations in the professional, technical, and managerial areas that have been the "traditional" job market for college graduates. The 136 occupations include only those in which in 1970 at least 15 percent of the workers had completed at least four years in a college program.

An example best illustrates the underlying rationale for the two projections. The conventional projection does not include openings for policemen, because in 1970 less than 15 percent of all policemen were college graduates, namely six percent. The comprehensive projection, on the other hand, includes *some* openings for policemen because by 1975 increasingly more policemen do have college training, and local governments seem eager to upgrade the educational attainment levels of their security forces. It is rationalized that if more occupations show growing percentages of workers with college degrees, why not include them in projecting employment opportunities for 1980's graduates?

High and Low Demand Projections

The terms comprehensive and conventional refer only to the number of occupations included in determining total demand for graduates. For particular occupations, high and low projections were developed by applying different industrial growth factors. In general the number of occupational openings developed according to the National Planning Association's industrial growth rates are below those resulting from each state's employment security agency industrial figures.

Openings

Openings in occupations include demand resulting from expansion of employment as industries grow; and from retirement, death, and other separations from the labor force. The openings are average annual openings for the 1970-80 period.

Portions of Openings to be Filled by College Graduates

Neither in the comprehensive nor conventional projections are *all* openings in each occupation considered on the demand side as employment opportunities for college graduates. Instead a percentage has been developed that represents, for each occupation, the portion of openings to be filled by persons with four or more years of college. This 1980 educational attainment percentage was obtained for each occupation by extending the U.S. pattern of the 1960-70 period to 1980. The 1980 percentage of all college level workers in an occupation was then transformed into the percentage of *new* workers needed with such educational attainment levels.

General

The procedures for establishing future levels of state market-ready supply and demand for degrees are identical with those followed at the regional level.[4] The state supply projections shown here are consistent with those described in the companion publication. Both the conventional and the comprehensive projections of demand are included in the analysis of the total range of college programs at the state level. The comprehensive demand projections include the demand from many occupations where college graduates are employed as well as the traditional professional occupations included in the conventional projections. Such demand has been relegated to the "all other" degree category and has no impact upon the demand for specific degree fields identified individually.

In the discussion of demand for individual degree programs for states the high and low projections have been averaged. They are both used as an average in this analysis to provide corroboration of the demand for individual degree categories. For a given degree category in a particular state these do not vary significantly.

It must be recognized that all of the disclaimers relating to the precision of manpower projections at the regional level apply even more strongly when considering smaller geographic areas such as states.[5] The projections of occupational demand therefore may not accurately depict what will actually occur. Similarly there will be imprecisions in the U.S. Office of Education degree projections or in adaptation of them to the Southern states and degree programs. The adjustment of degree production to market-ready entrants also could be inadequate, the projection of educational attainment could be overly optimistic or pessimistic, or the wrong occupations and degree categories may have been compared in converting demand for occupations to demand for degrees as shown in Appendix 1. Furthermore it is not known whether the data and projection inaccuracies are offsetting or are in the same direction and therefore cumulative.

Such imperfections are recognized in this analysis by designation of only the more extreme disagreements of supply and demand as imbalanced. Imbalance is defined in the discussion and in the construction of

degree surplus and deficit maps as consituting at least a 50 percent excess of supply over demand (surplus) or at least a 25 percent excess of demand over supply (deficit). For purposes of this calculation, in the field by field analysis, the high and low demand projections were averaged for each field and the result was used as the base for calculation of percentage relation to supply (surplus or deficit).

Balance Conditions in States and Degree Programs

When the conventional projections of demand for all college graduates are compared to the degree production levels shown in Table 1, high supply-demand ratios (i.e., degree surpluses) are identified for two states (Mississippi and West Virginia) while all other states in the region indicate relative balances of supply and demand. The comprehensive projection finds only West Virginia to have a potentially significant oversupply of graduates but identifies Maryland and Virginia as producing too few graduates to meet the projected demand by the imbalance criteria outlined earlier. The latter states may be interpreted as those needing to experience slower industrial growth during the 1970's than is assumed here (Appendix 2) or to make up the supply deficit through returning workers or interstate migration in order to achieve a supply-demand balance in college trained workers. In contrast, the states showing oversupplies of college graduates are likely to be net exporters

Table 1

Supply/Demand Comparisons for College Graduates, By States, 1980 (All Degree Levels)

State	Market-Ready Degree Supply	Demand for Degrees		Surplus or (Deficit)	
		Comprehensive Projection	Conventional Projection	Comprehensive Projection	Conventional Projection
Region	258,700	290,500	235,500	(31,800)	23,200
Alabama	15,050	13,900	11,900	1,150	3,150
Arkansas	8,000	9,400	5,900	(1,400)	2,100
Florida	28,450	36,300	33,600	(7,850)	(5,150)
Georgia	18,700	22,700	18,200	(4,000)	500
Kentucky	15,100	13,000	11,700	2,100	3,400
Louisiana	17,650	15,200	15,500	2,450	2,150
Maryland	15,900	25,800	17,700	(9,900)	(1,800)
Mississippi	10,600	10,000	7,000	600	3,600
North Carolina	22,200	23,300	20,000	(1,100)	2,200
South Carolina	9,650	11,600	9,100	(1,950)	550
Tennessee	19,950	17,500	15,300	2,450	4,650
Texas	52,700	59,300	46,500	(6,600)	6,200
Virginia	16,150	26,800	18,300	(10,650)	(2,150)
West Virginia	8,600	5,700	4,800	2,900	3,800

of workers with college degrees and, in fact, must rely upon outmigration to reach a supply-demand balance. Neither the returning worker nor worker migration variables are a part of these projections but will be a part of later analyses.

Similar observations may be made regarding the outlook for graduates in particular degree programs for each of the Southern states, again disregarding for the moment the impact of returning workers and the geographic mobility of already trained workers. In order to achieve balance in each field and state during the 1970-80 decade, all states will have to strike a "balance of trade" in the exchange of college trained skills, and the market profile will vary significantly from state to state. The network of state and field-specific oversupplies and shortages suggested by the projections is detailed below. Degree programs that are printed in italics are those for which extreme shortages (50 percent undersupply or more) or surpluses (100 percent oversupply or more) are projected. Majors that are not italicized conform to the criteria set forth earlier, and degree programs not included under either the deficit or surplus columns for a state are projected to be approximately in balance. States and programs that do not appear in the listings will still exchange graduates with other states and regions but will not have to rely upon worker interchange above and beyond that which would normally occur to bring about balance.

Projected Surpluses and Shortages by Field

	Deficit Fields	Surplus Fields
Region	Library Science, Social Work, *Hospital Administration, Medical Record Librarianship, Therapy*	Communications, Law
Alabama	*Library Science*, Social Work, *Dental Hygiene, Hospital Administration, Medical Record Librarianship*, Therapy	*Architecture*, Accounting, *Communications*, Education, Engineering, *Law*, Dentistry, *Optometry, Pharmacy, Veterinary Medicine*
Arkansas	Library Science, *Dentistry*, Dental Hygiene *Hospital Administration, Medical Record Librarianship, Optometry, Therapy, Veterinary Medicine*	*Architecture*, Education, Medical Laboratory Technology, Pharmacy
Florida	Engineering, Library Science, *Social Work, Dentistry, Dental Hygiene, Hospital Administration, Medical Laboratory Technology, Medical Record Librarianship, Medicine*, Nursing, *Optometry, Therapy, Veterinary Medicine*	*Communications*
Georgia	Social Work, Hospital Administration, Medical Laboratory Technology, Medicine, *Optometry, Therapy*	Architecture, *Communications*, Dentistry, Dental Hygiene, *Medical Record Librarianship, Pharmacy*

	Deficit Fields	Surplus Fields
Kentucky	Hospital Administration, *Medical Record Librarianship*, Optometry, *Therapy*, *Veterinary Medicine*	*Architecture*, Accounting, Education, Engineering, Law, *Dental Hygiene*, Medical Laboratory Technology
Louisiana	Library Science, *Hospital Administration*, *Optometry*, *Therapy*	*Architecture*, *Law*, *Dental Hygiene*, *Medical Laboratory Technology*, Nursing, Pharmacy, Veterinary Medicine
Maryland	Accounting, Communications, *Engineering*, Law, Library Science, *Social Work*, *Dental Hygiene*, *Hospital Administration*, *Medical Laboratory Technology*, *Medical Record Librarianship*, *Medicine*, *Optometry*, Pharmacy, *Therapy*, *Veterinary Medicine*	*Architecture*
Mississippi	Social Work, Dentistry, *Hospital Administration*, Medicine, Nursing, *Optometry*, *Therapy*	*Architecture*, *Accounting*, Communications, Education, Engineering, Law, Medical Laboratory Technology, Pharmacy, *Veterinary Medicine*
North Carolina	Accounting, Library Science, Social Work, Medical Laboratory Technology, *Medical Record Librarianship*, *Medicine*, *Optometry*, *Therapy*, *Veterinary Medicine*	Architecture, Law, *Dental Hygiene*, Pharmacy
South Carolina	Education, *Library Science*, *Social Work*, *Dental Hygiene*, *Hospital Administration*, *Optometry*, *Therapy*, *Veterinary Medicine*	*Architecture*, Communications, Dentistry, *Law*
Tennessee	Library Science, Social Work, *Dental Hygiene*, Hospital Administration, Medical Laboratory Technology, *Medical Record Librarianship*, Nursing, *Therapy*	*Architecture*, *Law*, Dentistry, *Optometry*, Veterinary Medicine
Texas	Social Work, Hospital Administration, Medical Laboratory Technology, *Medical Record Librarianship*, *Therapy*, Veterinary Medicine	Architecture, *Communications*, Law, *Dental Hygiene*, Optometry
Virginia	Accounting, *Communications*, Engineering, *Library Science* Social Work, Dentistry, *Hospital Administration*, *Medical Record Librarianship*, *Optometry*, *Therapy*, *Veterinary Medicine*	
West Virginia	Hospital Administration, *Medical Record Librarianship*, *Optometry*, Therapy, *Veterinary Medicine*	*Architecture*, Accounting, *Communications*, *Education*, *Engineering*, *Dentistry*, *Dental Hygiene*, *Medical Laboratory Technology*, *Pharmacy*

Figure 1 depicts the potential deficit-surplus pattern for **accounting** degrees, abstracted from the supply-demand relationships presented in Appendices 3 and 4. Despite a slight regional oversupply approximating 400 degrees per year, the states of Maryland, Virginia, and North Carolina will need to import large numbers of accounting degrees. On the other hand, West Virginia, Kentucky, Alabama, and Mississippi are likely to experience a surplus in accounting degrees. It must be noted that the number of degree deficits approximately equals the number of surplus degrees and yet a slight oversupply is projected for the region. This occurs because in states shown on the map as balanced, there are oversupplies which are, however, not significant enough to be identified by the 50 percent criterion.

A similar regional oversupply is noted in Figure 2 for degrees in **architecture**, and the surplus extends to all Southern states except Florida, Georgia and Virginia.

Although graduates with majors in **communications** may experience stiff competition for positions in the Southern region, Figure 3 indicates shortage conditions in Maryland and Virginia. Severe oversupplies are projected, however, for Alabama, Florida, Georgia, Texas and West Virginia, with slightly lower surpluses in Mississippi and South Carolina.

No Southern states show favorable market conditions for **education** graduates, as shown in Figure 4. Alabama, Arkansas, Kentucky, Louisiana and West Virginia demonstrate severe oversupplies and the regional outlook is correspondingly bleak.

A similar profile of poor opportunity, although with less extreme oversupplies, may be observed for **law** graduates in Figure 5. Only Maryland indicates shortage conditions, balanced conditions are projected for four states, and oversupplies ranging from 120 to 730 graduates per year are expected for the remaining nine states.

In spite of a projected balanced regional outlook for **engineering** graduates, Figure 6, the picture is mixed at the state level. Substantial shortages are expected in Florida, Maryland and Virginia, while Alabama, Kentucky, Mississippi and West Virginia may experience degree surpluses.

Although the results do not correspond to current market knowledge, extreme shortage conditions are projected both for the region and for most individual states in **library science** and **social work**. Figure 7 shows that **library science** degree surpluses are not indicated for any state. Georgia, Kentucky, Mississippi and West Virginia are approximately in balance with respect to the library field and all other states show projected library science deficits ranging from 30 graduates per year in Arkansas to 200 graduates in Virginia. Figure 8 indicates deficits in **social work** in nine states — from 60 graduates (Mississippi) to 390 graduates (Maryland). No states are projected to experience social work surpluses and only Arkansas, Kentucky, Louisiana, Tennessee and West Virginia are projected to be in balance.

In many of the health related professional fields, the interstate movement of graduates is routine, interchange is built into the location of pro-

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 1

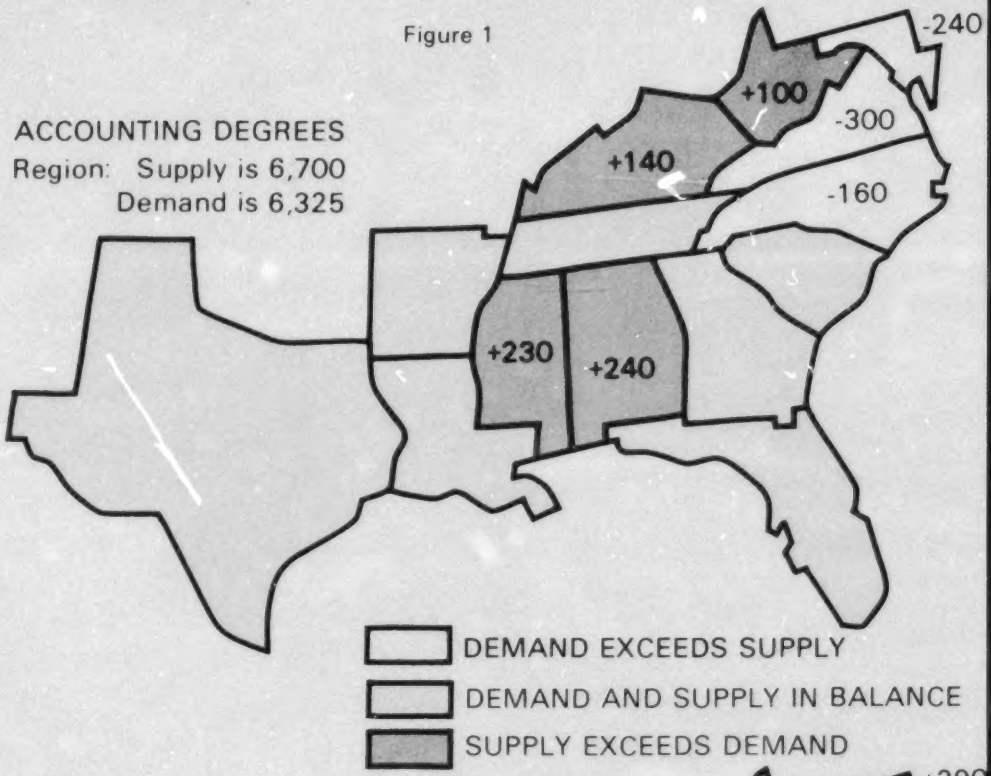
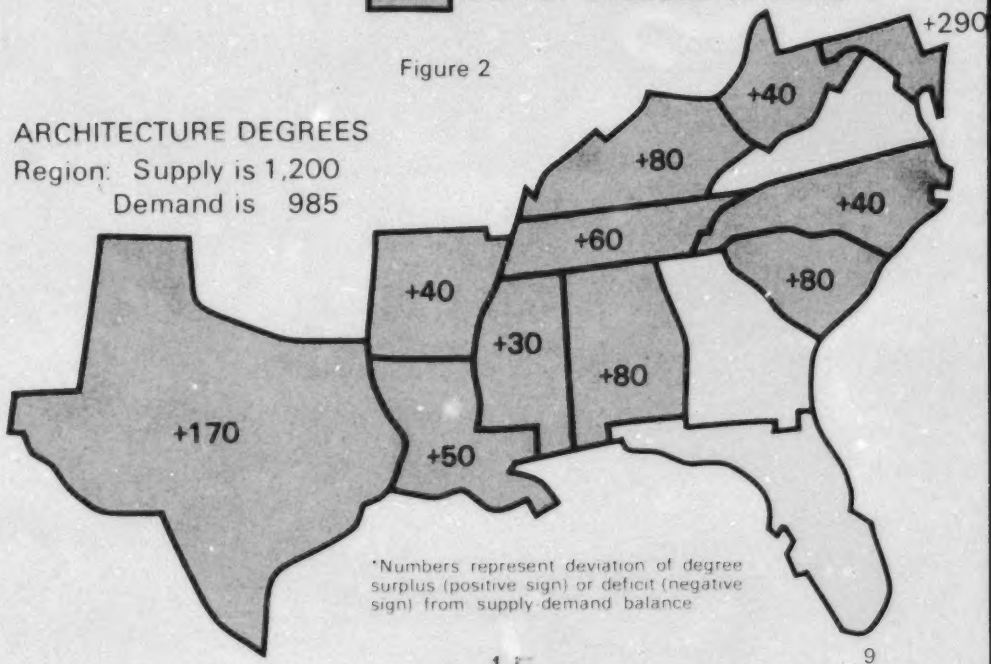


Figure 2



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 3

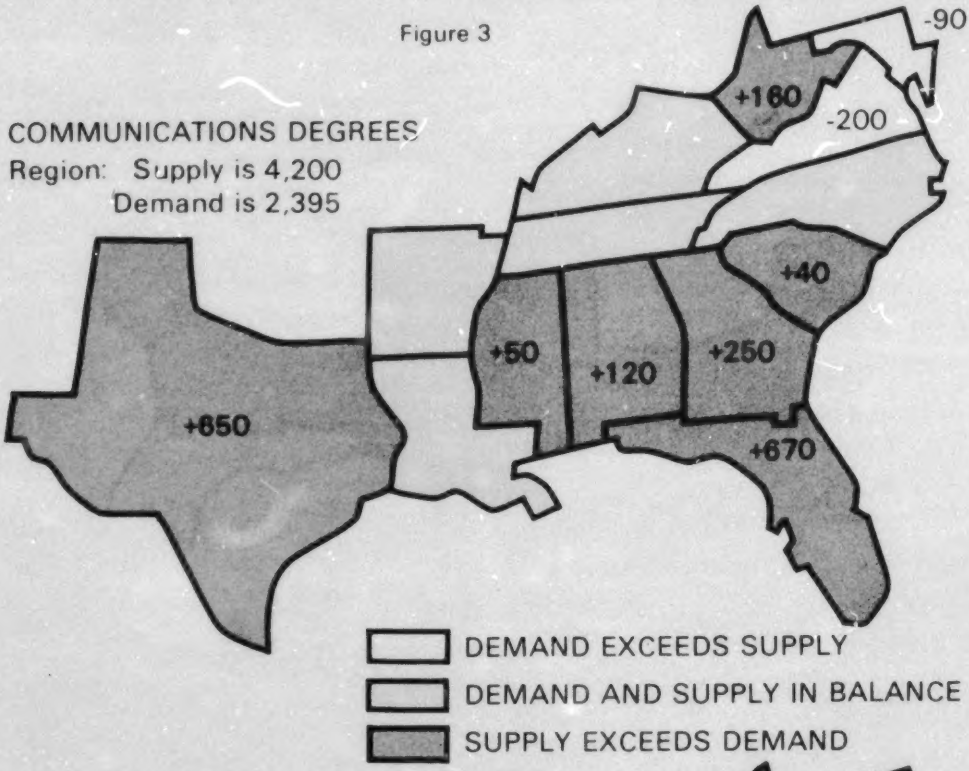
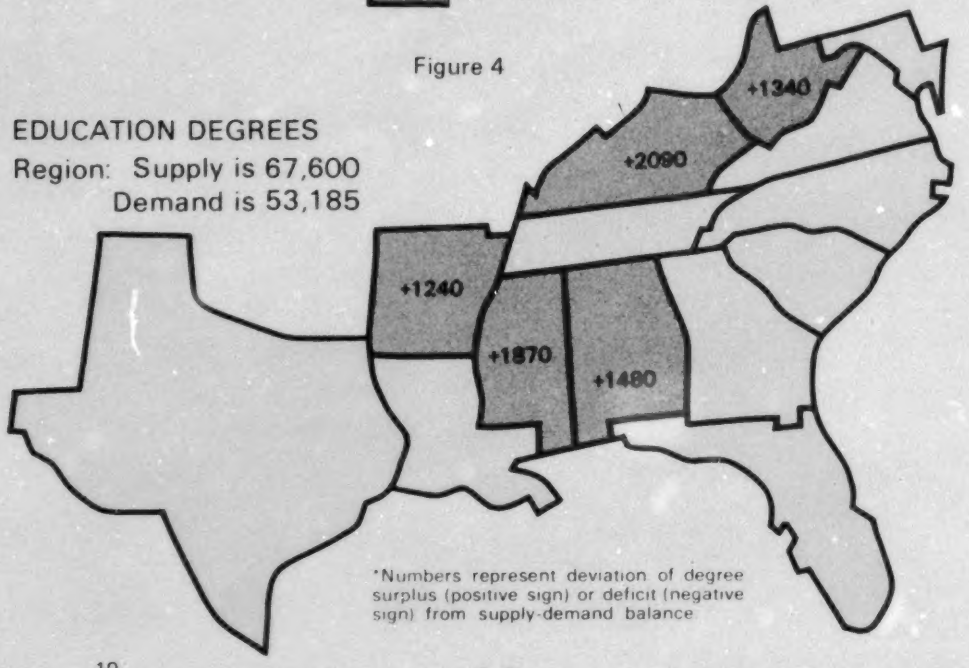


Figure 4



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 5

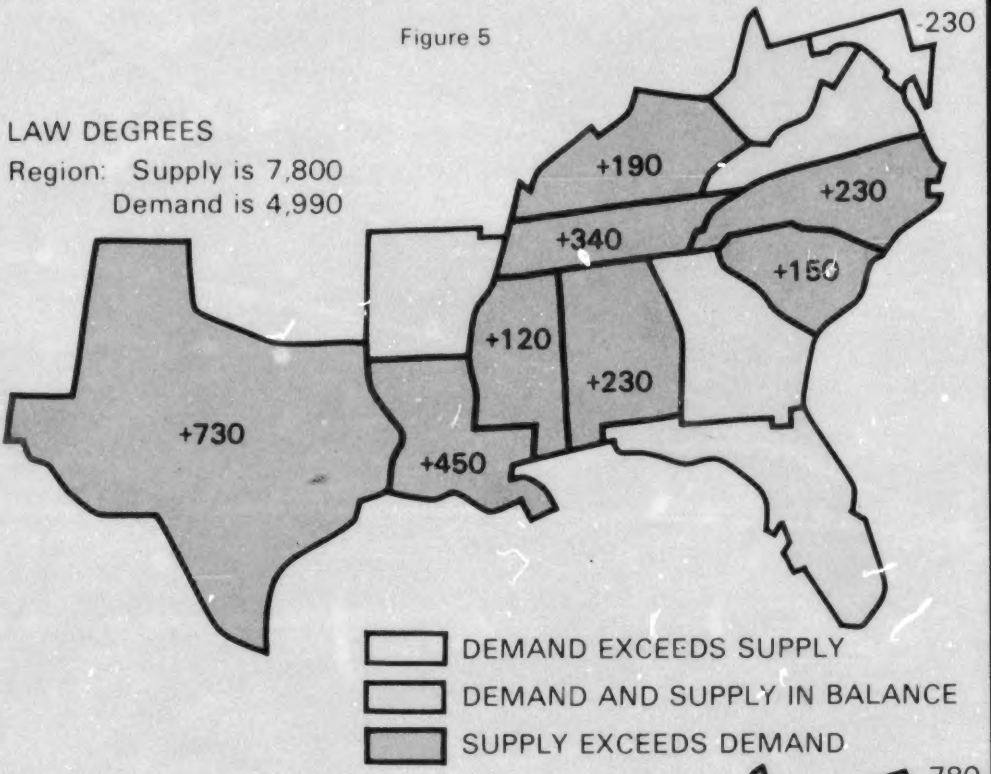
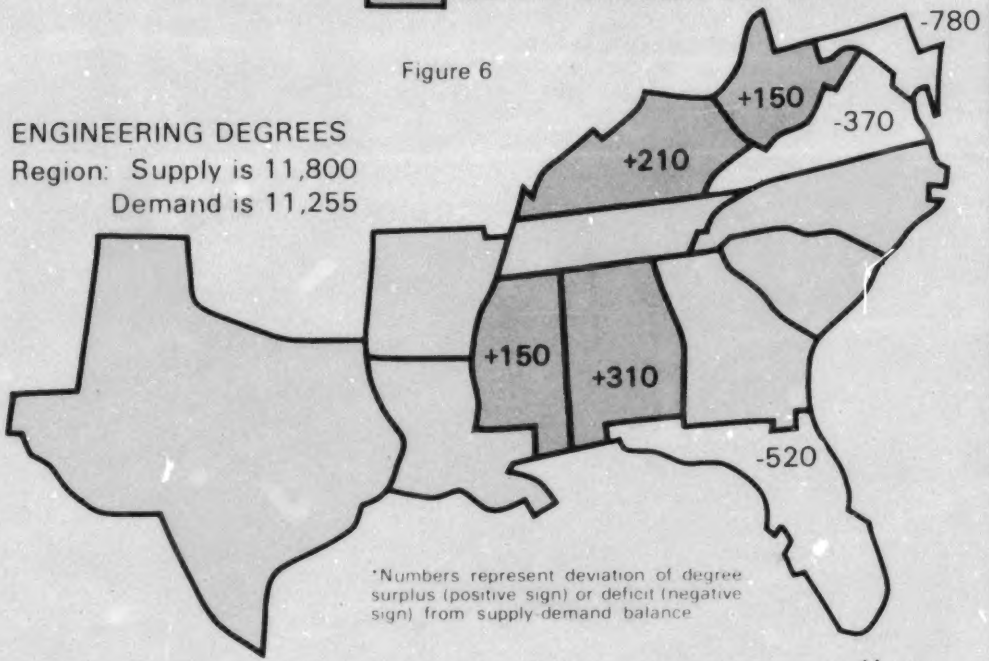


Figure 6



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 7

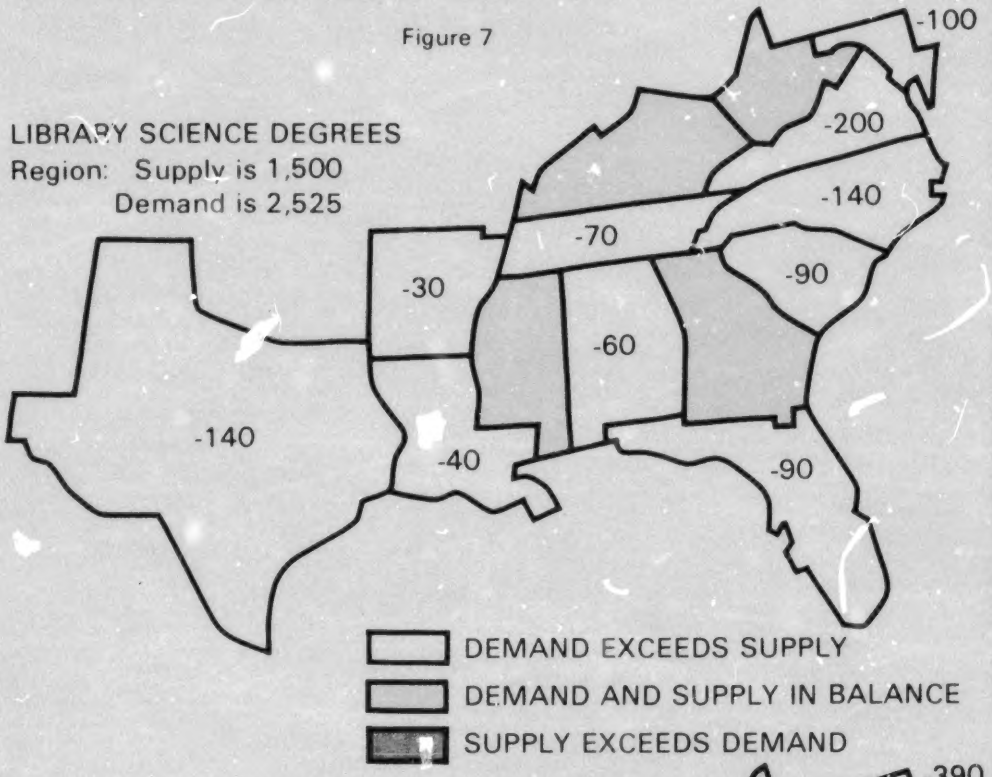
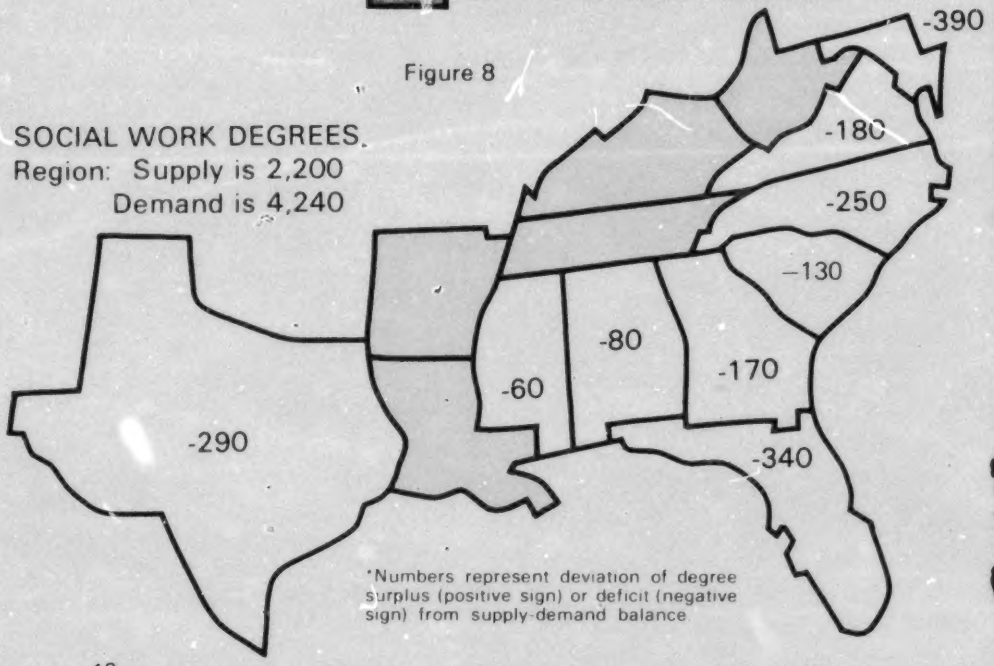


Figure 8



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance.

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 9

MEDICINE DEGREES
Region: Supply is 4,000
Demand is 4,825

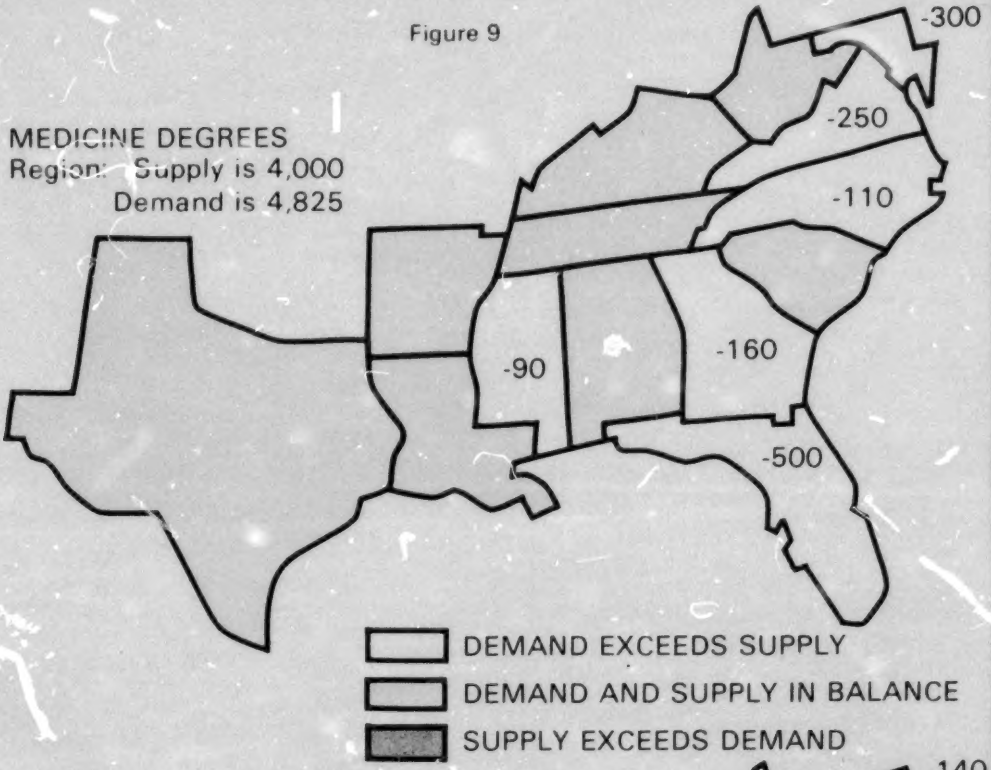
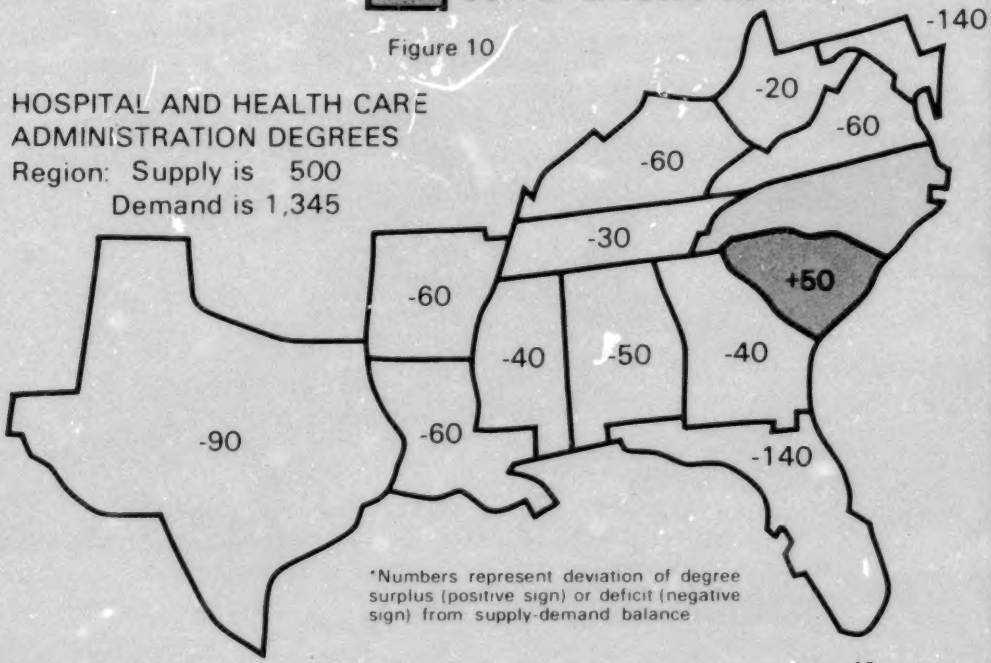


Figure 10

HOSPITAL AND HEALTH CARE
ADMINISTRATION DEGREES
Region: Supply is 500
Demand is 1,345



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 11

MEDICAL RECORDS
LIBRARIANSHIP DEGREES
Region: Supply is 100
Demand is 280

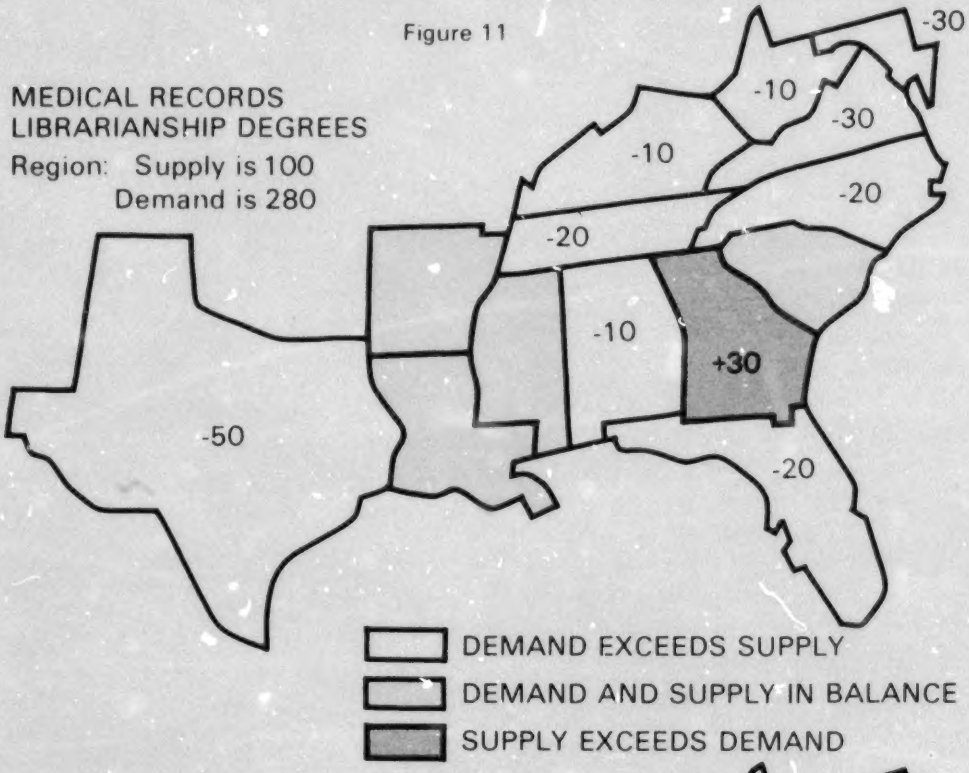
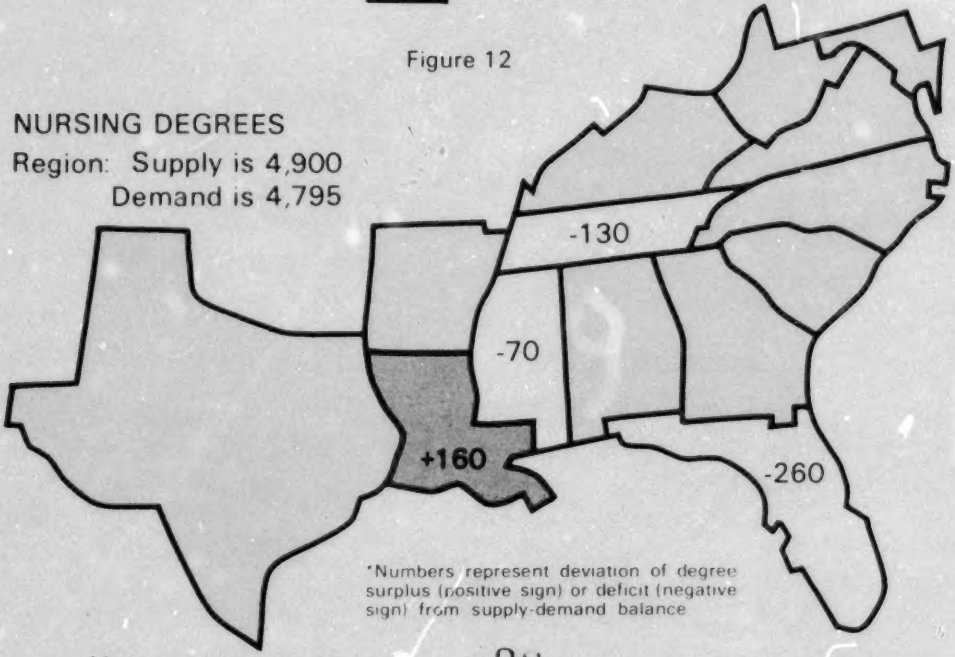


Figure 12

NURSING DEGREES
Region: Supply is 4,900
Demand is 4,795



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 13

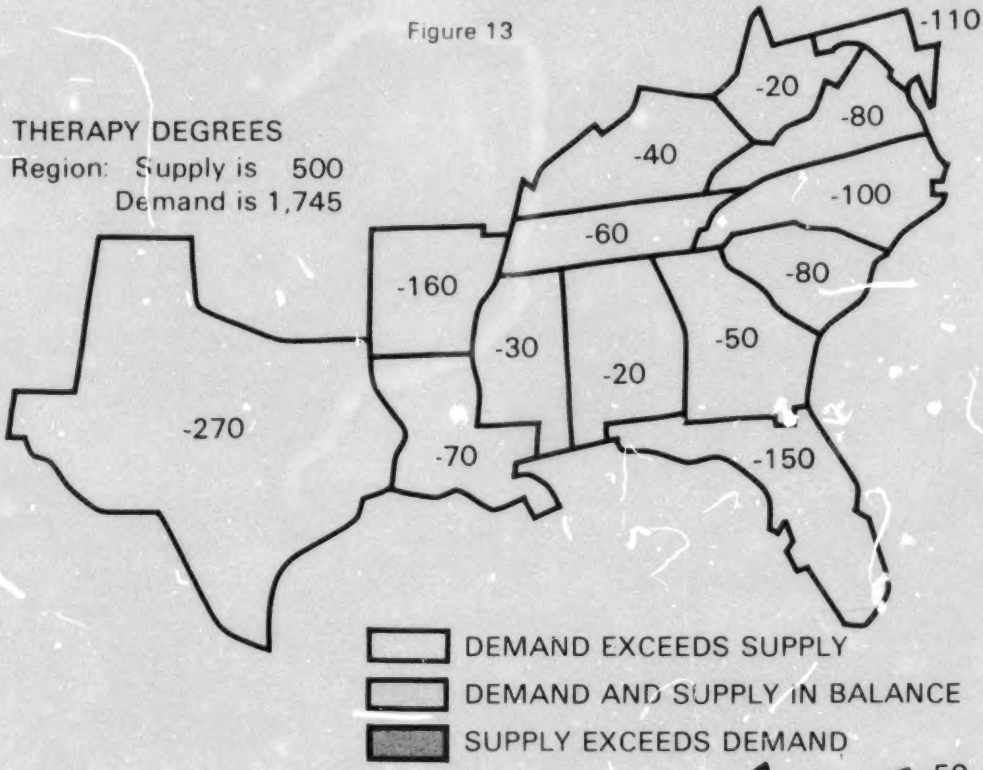
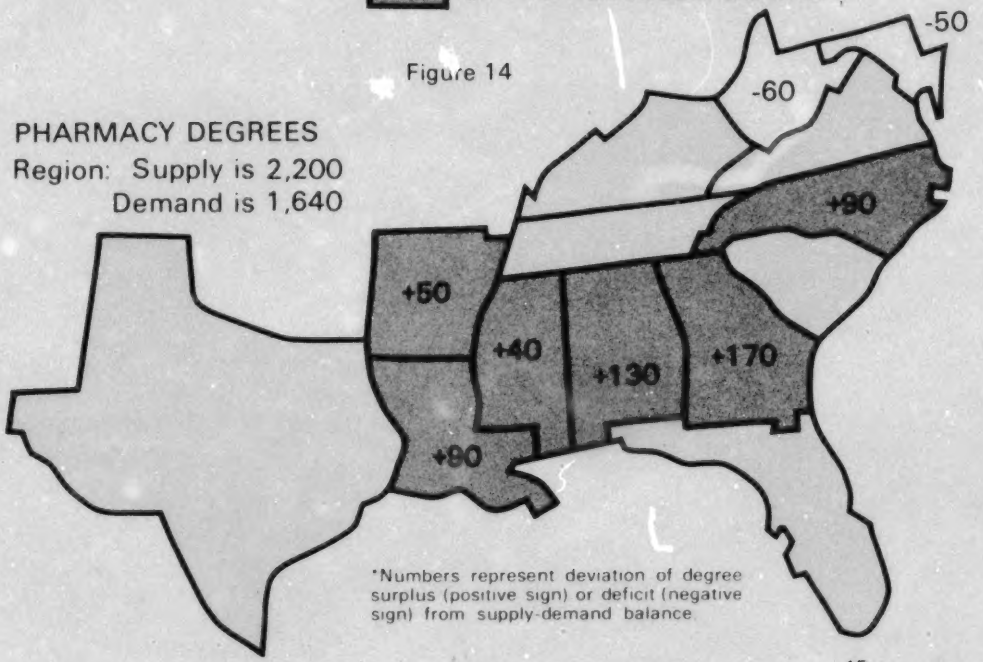


Figure 14



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 15

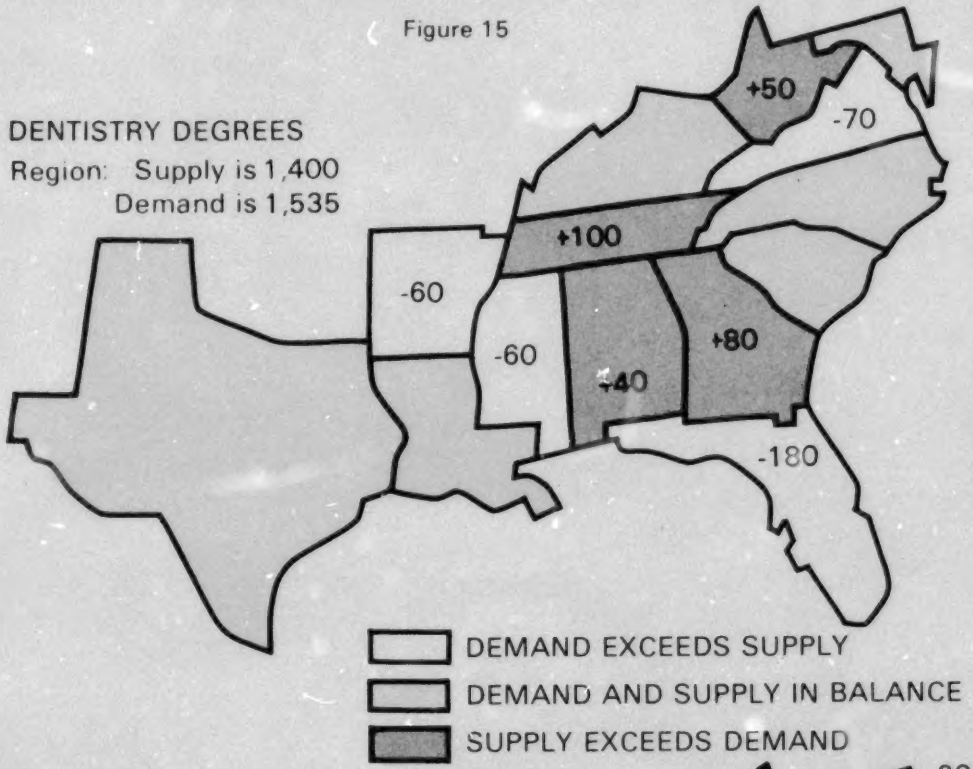
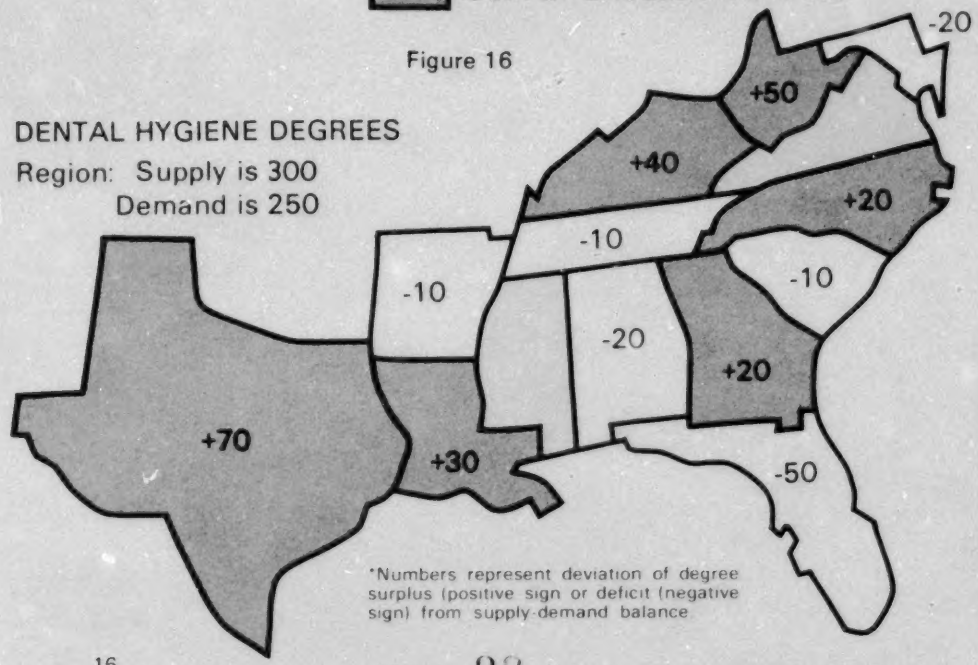


Figure 16



*Numbers represent deviation of degree surplus (positive sign or deficit (negative sign) from supply-demand balance

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 17

MEDICAL LABORATORY
TECHNOLOGY DEGREES
Region: Supply is 2,000
Demand is 2,280

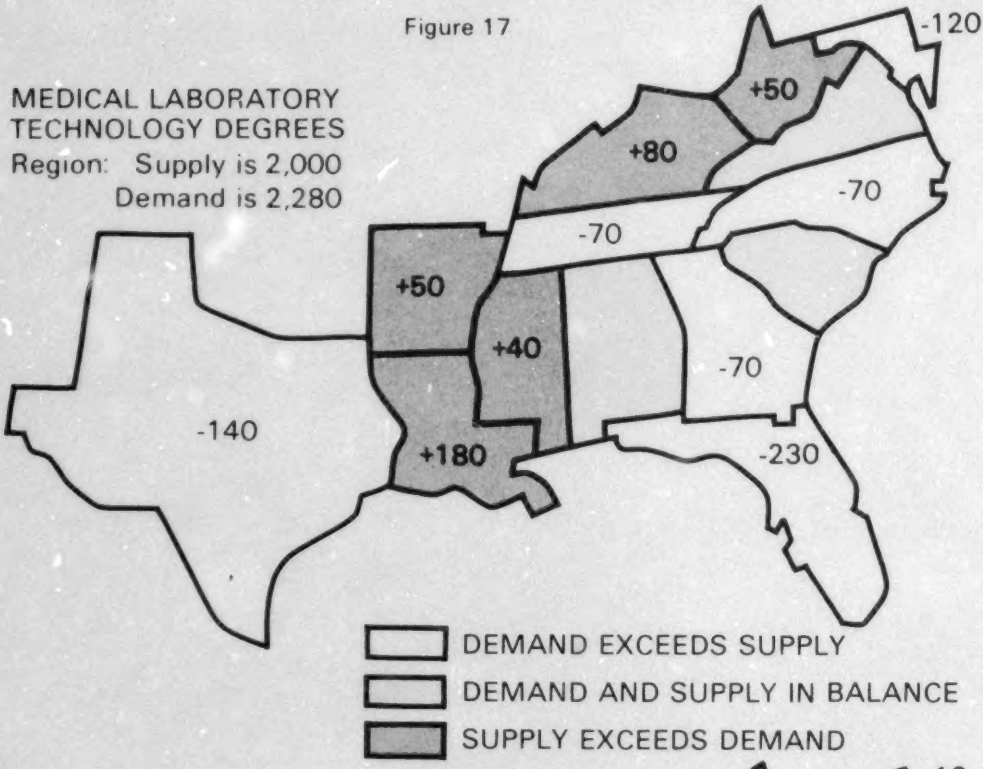
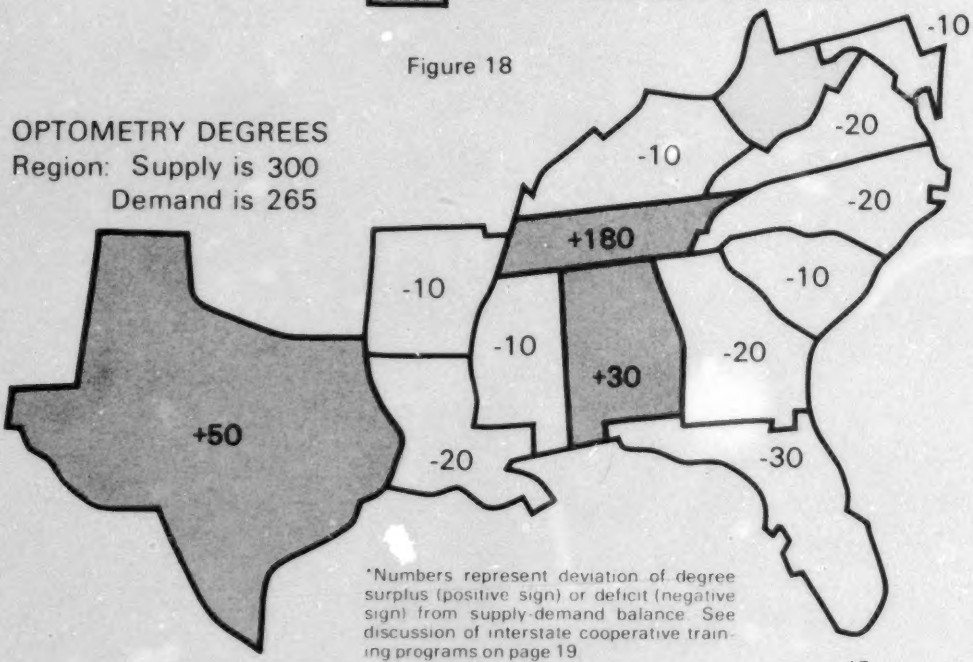


Figure 18

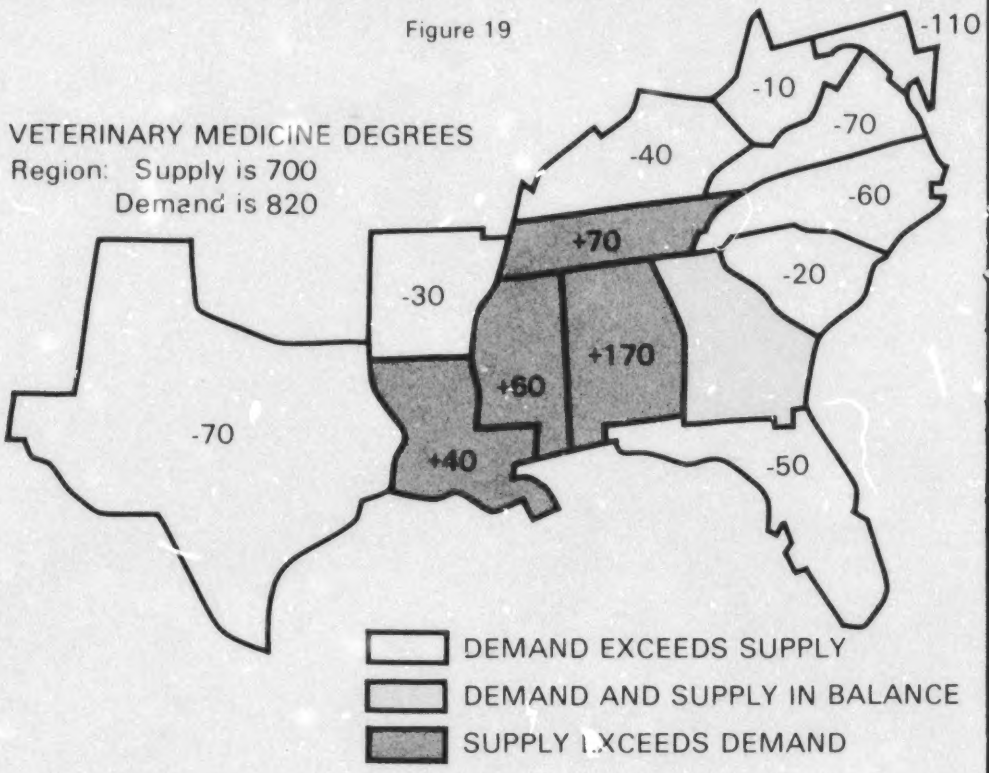
OPTOMETRY DEGREES
Region: Supply is 300
Demand is 265



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance. See discussion of interstate cooperative training programs on page 19.

AVERAGE ANNUAL 1970-80 SUPPLY-DEMAND BALANCE*

Figure 19



*Numbers represent deviation of degree surplus (positive sign) or deficit (negative sign) from supply-demand balance. See discussion of interstate cooperative training programs on page 19.

Supply projections for this field have been augmented by planned expansion of capacity at the University of Georgia and the establishment of new schools in Florida, Louisiana, Mississippi and Tennessee.

fessional schools, and the state-by-state supply-demand analysis merely confirms the expected surplus and deficit patterns. For example, Arkansas has no dental school and therefore imports dentistry graduates from other states to satisfy its demand for dentists.

Another development in educational exchange tends to stimulate state-to-state movement as well. Southern Regional Education Board interstate contracts for services and tuition aid are designed to foster cooperation among states in educational programs. Under the SREB contracts for services, for example, students in five separate disciplines pursue degrees in other states. Contractual support is provided by the state of residence, which usually has no program in that field. Such arrangements regularize a system of deficits, surpluses, and complementary movement of graduates in relatively expensive fields with few programs. Their impact is most obvious in veterinary medicine and optometry, fields in which the 14 states of the region now share the graduates of only five and three schools, respectively.

Other circumstances may intervene, however, to prompt imbalances. For example, states would not necessarily be expected to consume locally all of the production of their medical schools. Nonetheless, all Southern states but two could accommodate their medical school graduates within the state, and five states would still need to import to satisfy at least 25 percent of their demand. Figure 9 notes that only Arkansas and Tennessee are projected to produce more **medicine** and **osteopathy** graduates than those states demand but (1) neither state will reach sufficient oversupply conditions to be identified as a surplus state; and (2) these states together do not have sufficient surpluses to offset the undersupplies in other states, ranging from 90 per year in Mississippi to 500 in Florida.

Other health-related disciplines with a predominance of balanced or deficit states are: **hospital and health care administration,** Figure 10, (13 deficit states and North Carolina balanced); **medical record librarianship,** Figure 11, (10 deficit states and Georgia surplus); **nursing,** Figure 12, (three deficit states and Louisiana surplus); and **physical and occupational therapy,** Figure 13, (all states deficit). At the other end of the scale is **pharmacy,** Figure 14, with seven states having surplus graduates in the context of a 560 per year regional oversupply and with Maryland the only state showing a deficit, at a rate of 50 per year.

The remaining health disciplines follow the expected health professional school pattern of mixed deficits and surpluses. Figure 15 notes a regional shortage of 65 degrees each year for **dentistry,** with four deficit states (Arkansas, Florida, Mississippi and Virginia) and four surplus states (Alabama, Georgia, Tennessee and West Virginia). **Dental hygiene** (4-year) supply and demand are balanced only in Mississippi and Virginia as indicated in Figure 16. The relationships in other Southern states run from an annual surplus of 70 in Texas to a shortage of 50 in Florida. Deficits of **medical laboratory technology** graduates are indicated in Figure 17 for Florida, Georgia, Maryland, North Carolina, Tennessee and Texas, while surpluses are projected for Arkansas,

Kentucky, Louisiana, Mississippi and West Virginia. Figure 18 shows that **optometry** deficits occur in 10 states, with only Alabama, Tennessee and Texas supplying surplus graduates. **Veterinary medicine,** Figure 19, has a unique profile of deficit states at the eastern and western edges of the region and a cluster of four surplus states at the interior portion of the region. Projected supply levels for this field incorporate anticipated new programs and planned expansion of existing schools for several states through the early 1980's.

It may be observed that supply-demand imbalances are projected for all or nearly all 14 Southern states only in the fields of hospital and health care administration, physical and occupational therapy and veterinary medicine. This is due in part to the general regional outlook for each discipline and the uneven geographic distribution of schools among states, but in some cases is attributable to the small supply and demand numbers involved and to the inappropriate matching of degree programs with occupational demand.

Conclusions and Implications

Generally the data reflect limited opportunities for Southern college graduates in the traditional field of work (conventional projection) but show openings in the extended list of occupations (comprehensive projection) to be more likely during the 1970's. The outlook for graduates varies from state to state, with Florida, Maryland and Virginia having a favorable outlook in nearly all major fields of college study and absorbing some of the surpluses generated by neighboring states. Similarly, selected disciplines indicate favorable opportunities regardless of the state (librarianship, social work, medicine, health care administration and therapy) and still other combinations of states and college major fields have an excellent outlook (e.g., accounting in North Carolina).

Some Southern states already consider manpower demand information indirectly as one criterion in evaluating educational plans and in reviewing budget requests. Many university programs are threatened by current lower college attendance rates, the coming demographic pinch of fewer potential students, and by market conditions for graduates.[6] Of course, there is the danger that the findings shown here could be used as an across-the-board funding watchdog. However, a clear and overriding implication of the state analysis is that the use of the findings for such purposes is not justified.

The major conclusion reached is that, without exception, all states have some programs that are over- or under- producing for local consumption. That is, each state trains a surplus in some disciplines but produces a deficit in others. Selective use of manpower materials in budget review would aid in more judicial use of public funds, but uniform and strict application to all states and programs for restricting higher education appropriations would be self-defeating by prompting (1) fiscal expenditures approximately equal to current levels, (2) extended delays in beginning local programs to meet local shortages, and (3) a generally unhealthy atmosphere of provincialism.

Manpower findings such as those presented here are readily applied to personal career planning and guidance counseling. Of course the conclusions reached in any projections are subject to the standard hazards of interpretation, and this is especially true in the manpower area.[7] In addition, personal freedom of choice among college programs and occupations is the prime consideration and should not be obscured by a zeal to make supply and demand correspond precisely or to bring state budgets in line with anticipated revenues. Higher education does more than to prepare students in the technical skills necessary to obtain a job.

Nonetheless the fiscal crises in state budgets and university fundings are a reality, as are graduates without jobs, graduates who are underemployed or graduates who are in positions at lower pay levels in recent

years.[8] This is advantageous for employers who may now "upgrade" the educational level of their employees at a lower cost than under balanced or shortage conditions. The market is responsive to earlier supply-demand balances and the slow market conditions today for graduates in particular fields may prompt upgrading or field switching which will later bring supply and demand more nearly into balance.[9] Unfortunately this also implies, however, an interactive effect on related fields and brings about encroachment or "bumping" of workers with lower educational levels.

The possibility that "things may work themselves out" in this manner from a manpower perspective should not be taken as license for inaction by educational planners, however. The slowdown in higher education enrollment growth due to demographic events is yet to come. The lower levels of births beginning in the late 1950's will not really be felt until 1977 and beyond. In fact, in light of a reduced potential clientele, low attendance rates, continued inflation, and faltering state funding, the manpower supply-demand picture may be part of the "good news" that will support some expanding higher education programs.

Appendix 1

Occupations and Degree Programs Compared in Supply-Demand Analyses

Occupations	Degree Programs
Architects	Architecture (excluding Planning)
Accountants Real Estate Appraisers	Accounting
Editors and Reporters Public Relations and Publicity Writers Radio and Television Announcers	Communications
Prekindergarten and Kindergarten Teachers Elementary School Teachers Secondary School Teachers Coaches and Physical Education Teachers Education Teachers School Administration, Elementary and Secondary Schools Other Teachers, except College and University	Education and a percentage of other fields of study*
Aeronautical and Astronautical Engineers Chemical Engineers Civil Engineers Electrical and Electronic Engineers Industrial Engineers Mechanical Engineers Metallurgical and Materials Engineers Mining Engineers Petroleum Engineers Sales Engineers Other Engineers Engineering Teachers Tool Programmers, Numerical Control	Engineering
Lawyers Judges Law Teachers	Law

*The fields from which varying percentages are assigned to Education because they produce specialized majors with teaching certificates were determined by reference to National Education Association, *Research on Teacher Supply and Demand in Public Schools, 1972, Table 2*

Occupations	Degree Programs
Librarians	Library Science
Social Workers	Social Work and Social Services

Health Professions

Dentists	Dentistry
Dental Hygienists	Dental Hygiene
Health Administrators	Hospital Health Care Administration
Clinical Laboratory Technologists and Technicians	Medical Laboratory Technology
Health Record Technologists and Technicians	Medical Record Librarianship
Physicians, Medical and Osteopathic	Medicine and Osteopathy
Registered Nurses	Nursing
Optometrists	Optometry
Pharmacists	Pharmacy
Therapists	Physical and Occupational Therapy
Veterinarians	Veterinary Medicine

Appendix 2

Comparison of 1970-1980 Employment Growth Rates In Comprehensive and Conventional Demand Projections

Employment Percentage Change 1970-1980

State	Comprehensive	Conventional	Ratio (Conventional/ Comprehensive)
SREB Region	21.4	25.3	1.17
Alabama	14.8	17.2	1.16
Arkansas	17.9	24.5	1.37
Florida	28.3	41.3	1.46
Georgia	23.4	25.2	1.08
Kentucky	21.4	25.3	1.18
Louisiana	15.7	22.0	1.40
Maryland	29.7	26.0	0.88
Mississippi	13.4	25.2	1.88
North Carolina	20.5	25.3	1.23
South Carolina	17.8	11.9	0.67
Tennessee	17.9	29.9	1.67
Texas	21.1	22.4	1.01
Virginia	24.7	25.5	1.03
West Virginia	13.2	16.6	1.26

Sources: *Conventional* — Data from Table 2 of the 1974 Interim Manpower Projections Program printouts were utilized from each state Employment Security agency except where replaced in formally published materials.

Comprehensive — Joe Won Lee and William B.D. Hong, *Regional Economic Projections: 1960-85* (Washington, D.C.: The National Planning Association, Report No. 73-R-1, December, 1973), Table IV.

Appendix 3

Projected Demand for Bachelor's and Higher Degrees By Program and State*

	Region	Ala.	Ark.	Fla.	Ga.	Ky.
Total	260,350	12,820	7,590	34,350	20,295	12,130
Accounting	6,325	265	155	905	535	265
Architecture	985	25	15	180	70	25
Communications	2,395	75	70	335	145	90
Education	53,185	2,725	1,360	6,780	4,275	2,815
Engineering	11,255	490	200	1,715	695	395
Law	4,990	170	135	615	325	215
Library Science	2,525	110	80	285	210	130
Social Work	4,240	185	130	540	370	265
Health						
Dentistry	1,535	60	60	200	115	70
Dental Hygiene	250	25	15	45	30	10
Hospital and Health Care Administration	1,345	70	65	150	85	65
Medical Laboratory Technology	2,280	105	55	330	170	125
Medical Record Librarianship	280	10	10	30	25	15
Medicine and Osteopathy	4,825	205	185	705	355	260
Nursing	4,795	230	115	655	340	215
Optometry	265	10	10	25	15	5
Pharmacy	1,640	70	50	195	130	80
Physical and Occupational Therapy	1,745	55	165	250	100	70
Veterinary Medicine	820	35	30	100	80	35
All Other	154,710	7,905	4,690	20,315	12,225	6,995

*Average of high and low projections. Figures in the body of the table will not add to regional and state totals due to the averaging of values and rounding.

La.	Md.	Miss.	N.C.	S.C.	Tenn.	Texas	Va.	W.Va.
15,350	21,755	8,460	21,375	10,250	16,275	52,760	22,565	5,240
345	640	170	460	175	340	1,370	600	105
50	105	20	60	25	45	235	125	5
70	295	55	150	65	150	555	295	45
3,355	2,970	2,230	4,525	2,920	3,500	10,225	4,245	1,260
560	1,385	250	740	350	715	2,350	1,270	150
245	735	180	275	150	260	1,070	625	80
140	195	95	245	145	165	440	250	40
230	490	160	355	150	265	595	380	125
90	120	65	105	55	105	310	170	50
5	20	5	20	10	15	35	15	5
60	145	40	120	45	75	290	110	35
120	215	60	170	70	175	445	195	50
15	30	10	20	10	20	55	25	10
310	615	190	410	235	315	1,115	555	110
235	430	170	405	200	335	870	470	115
15	15	5	25	10	20	55	20	5
115	150	65	110	75	120	350	95	35
80	150	40	130	85	105	370	135	25
65	110	40	60	15	35	165	75	15
9,245	12,955	4,620	12,995	5,470	9,530	31,865	12,915	2,990

Appendix 4

Market-Ready Supply of Bachelor's and Higher Degrees By Program and State

Degree Program	Region[a]	Ala.	Ark.	Fla.	Ga.	Ky.
Total	258,300	15,100	8,000	28,500	18,700	15,100
Accounting	6,700	500	200	900	500	400
Architecture	1,200	100	b	200	100	b
Communications	4,200	200	100	1,000	400	100
Education	67,600	4,200	2,600	7,300	4,500	4,900
Engineering	11,800	800	200	1,200	800	600
Law	7,800	400	200	900	400	400
Library Science	1,500	b	b	200	200	100
Social Work	2,200	100	100	200	200	200
Health						
Dentistry	1,400	100	b	b	200	100
Dental Hygiene	300	b	b	b	b	b
Hospital & Health Care Administration	500	b	b	b	b	b
Medical Laboratory Technology	2,000	100	100	100	100	200
Medical Record Librarian	100	b	b	b	b	b
Medicine & Osteopathy	4,000	200	200	200	200	200
Nursing	4,900	200	100	400	300	300
Optometry	300	b	b	b	b	b
Pharmacy	2,200	200	100	200	300	100
Physical & Occupational Therapy	500	b	b	100	b	b
Veterinary Medicine	700	200	b	b	100	b
All Other	138,400	7,800	4,100	15,600	10,400	7,500

[a]State values will not add precisely to regional figures due to rounding
[b]Entry is less than 50

La.	Md.	Miss.	N.C.	S.C.	Tenn.	Texas	Va.	W.Va.
17,700	15,900	10,600	22,200	9,600	20,000	52,700	16,200	8,600
500	400	400	300	200	500	1,400	300	200
100	b	b	100	100	b	400	100	b
100	200	100	200	100	200	1,200	100	200
4,400	3,500	4,100	5,600	2,200	5,100	12,700	4,000	2,600
800	600	400	1,000	400	1,000	2,900	900	300
700	500	300	500	300	600	1,800	500	100
100	100	100	100	b	100	300	b	b
300	100	100	100	b	200	300	200	100
100	100	b	100	100	200	300	100	100
b	b	b	b	b	b	100	b	100
b	b	b	100	b	b	200	b	b
300	100	100	100	100	100	300	200	100
b	b	b	b	b	b	b	b	b
300	300	100	300	200	400	1,000	300	100
400	600	100	500	200	200	1,000	400	100
b	b	b	b	b	200	100	b	b
200	100	100	200	100	100	400	100	100
b	b	b	b	b	b	100	100	b
100	b	100	b	b	100	100	b	b
9,300	9,300	4,600	13,000	5,600	11,000	28,100	8,900	4,500

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[1]Alabama Commission on Higher Education, *Alabama College-Level Manpower: A Preliminary Study of Supply and Demand* (Mobile, Alabama: State of Alabama, 1972); Joseph S. Lechowicz, *Manpower Requirements Report to 1980: Jobs for University of Georgia Graduates in Georgia and the Nation* (Athens, Georgia: The University of Georgia Office of Program Planning and Analysis, 1973); and Bruce D. Mitchell and C.J. Carter, "College Educated Workers in Florida, 1970-75, A Study of Supply and Demand," unpublished working papers Report 72-2, Office of Planning and Evaluation, Florida Board of Regents, January 20, 1972.

[2]Richard A. Engels and Eva C. Galambos, *Supply and Demand for College Graduates in the South, 1980* (Atlanta, Georgia: Southern Regional Education Board, 1975).

[3]E.F. Schietinger, *Degree Output in the South, 1971-72* (Atlanta, Georgia: Southern Regional Education Board, 1975); the U.S. Office of Education, *Earned Degrees Conferred: 1970-71* (Washington, D.C.: U.S. Government Printing Office, 1973); and the U.S. Office of Education, *Projections of Educational Statistics to 1982-83* (Washington, D.C.: U.S. Government Printing Office, 1974).

[4]Richard A. Engels and Eva C. Galambos, *op. cit.*, pp. 2-3.

[5]Richard A. Engels and Eva C. Galambos, *op. cit.*, pp. 20-21.

[6]The Carnegie Foundation for the Advancement of Teaching, *More than Survival* (San Francisco: Jossey-Bass Publishers, 1975), pp. 86-94.

[7]Bashir Ahamad and Mark Blaug (eds.), *The Practice of Manpower Forecasting* (San Francisco: Jossey-Bass Publishers, 1973), pp. 321-322.

[8]The Carnegie Foundation, *op. cit.*

[9]Richard B. Freeman and David W. Breneman, *Forecasting the Ph.D. Labor Market: Pitfalls for Policy* (Washington, D.C.: National Board on Graduate Education, 1974).